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Conference Abstract

Contributions to Biodiversity Data in the Global South: Digitization Progress and Open Data Through SiBBr at the Museu Nacional/UFRJ, Brazil

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Abstract

Museums and their natural history collections (NHCs) have become increasingly interconnected through the digitization of information about specimens (Bakker et al. 2020). In the last two decades, some South American countries have joined biodiversity data digitization programs and projects, including Brazil (Nelson and Ellis 2018). In this sense, initiatives such as Brazilian Biodiversity Information System (SiBBr), a country-level branch of the Global Biodiversity Information Facility (GBIF), aim to encourage and establish ways for the digitization of biological collections. Established in 1818, the *Museu Nacional* of the *Universidade Federal do Rio de Janeiro* (MN), is the oldest scientific institution in Brazil and ranks among the most important repositories of NHCs in the Global South (Serejo et al. in press). Since its foundation, the MN has played an important role in promoting and disseminating public knowledge, such as culture, education, and scientific research (Rodrigues-Carvalho et al. 2012). This role is extremely important, given that Brazilian institutions often face resource limitations and structural vulnerabilities (Marinoni et al. 2024). On September 2, 2018, a catastrophic fire engulfed the *Palácio de São Cristóvão*, destroying significant portions of its collections (Zamudio et al. 2018). Despite this devastating event and the loss of the vast majority of

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specimens deposited in the NHCs of that building, some holdings had been extensively digitized and had their information preserved through the SiBBr project, such as the entomological collection (De Almeida et al. 2021). Collections located in other MN's buildings and not affected by the fire, such as the vertebrate collections, have continued to be digitized to the present day through the COLBIO project ("Restructuring the *Museu Nacional*/UFRJ through its Biological Collections: Digitization, Curation, and Metadata Management for Open Access"). The objective of this work is to publicize the digitization progress of the MN's NHCs, as well as the availability of their open data through the SiBBr. All data studied are based on the MN institution and its NHCs. In 2022, the COLBIO project was launched, alongside the creation of the Laboratory of Digital Collections (COLDIGI), a hub for developing and managing digital infrastructure. New photographic stations and digitization protocols were implemented, and long-standing databases previously managed in spreadsheets are being migrated to Specify 7. This marks the first fully institutional initiative dedicated to the digitization of MN's NHCs, with an initial focus on rare, historical, and type material. Four major collection areas are currently involved: entomology, invertebrates, vertebrates, and botany. By December 2024, 22,081 images had been captured, representing 4,544 specimens across 3,743 species. Among these, 3,805 images correspond to nomenclatural types (783 specimens and 645 species). Thousands of entomological type images previously digitized under the SiBBr project were crucial for digitally preserving part of the collection, as nearly all physical specimens were lost in the fire (see De Almeida et al. 2021). Final image editing has been completed for zoological collections digitized under the COLBIO (Fig. 1) and SiBBr (Fig. 2) projects, as well as individual initiatives, totaling 2,768 images from seven collections. A key goal of the COLBIO project is the migration of zoological collection databases to Specify 7. Currently, 18 databases are hosted on the Specify Consortium's cloud service, which provides automated daily backups. To date, 14 datasets have been published on the SiBBr, totaling 510,956 publicly available records, most without images. Besides SiBBr, an institutional platform for MN's collections is under consideration. The COLBIO project and related digitization initiatives demonstrate how digital technologies now function both as safeguards and as strategic extensions of the MN's scientific mission, ensuring the preservation, accessibility, and resilience of biological data, even under catastrophic circumstances.

Keywords

biological collections, Brazilian Biodiversity Information System, digital preservation, natural history collections

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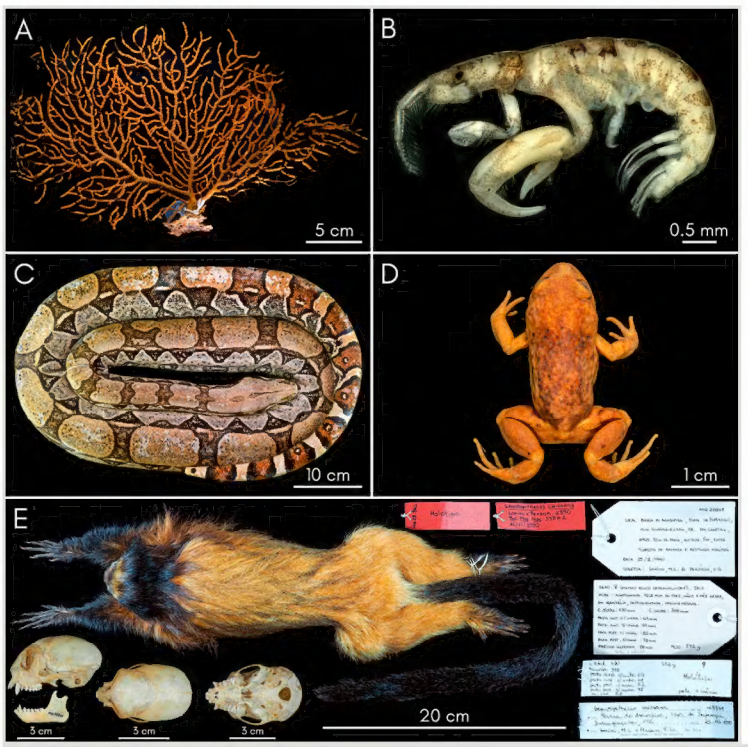

Figure 1.

COLBIO at the *Museu Nacional*/UFRJ. **A**, *Muricea flamma* Marques & Castro, 1995, paratype, MNRJ 1835 (Octocorallia). **B**, *Jassa valida* (Dana, 1853), neotype, MNRJ 29820 (Amphipoda). **C**, *Boa atlantica* Gonzalez et al. 2024, holotype, MNRJ 27242 (Serpentes). **D**, *Holoaden bradei* Lutz, 1958, holotype, MNRJ 4087 (Anura). **E**, *Leontopithecus caissara* Lorini & Persson, 1990, holotype, MN 28861 (Primates). Imaging by: AS Nascimento (A–B); R Rodrigues (C–D); M Laeta (E). Editing/post-processing: MVO De Almeida (A–E). CC BY 4.0.

Figure 2.

SiBBr at the *Museu Nacional*/UFRJ. **A**, SiBBr work team. **B**, *Ceratocapsus roppai* Carvalho & Fontes, 1983 (Hemiptera) original labels. **C**, type material of butterflies and moths (Lepidoptera). **D**, *Remartinia restricta* Carvalho, 1992, holotype, MNRJ-ENT4-9 (Odonata). Imaging by: CA Mello-Patiu (A); MVO De Almeida (B–D). Editing/post-processing by: MVO De Almeida (A–D). CC BY 4.0.

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Conflicts of interest

The authors have declared that no competing interests exist.

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